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The Three-Year Experience with the Community Reinvestment Act

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CREDIT is a scarce commodity. As lenders allocate available funds on the basis of a variety of considerations, including price (interest rates), ability to repay, maturity of the loan and costs of servicing, it is generally difficult for an outside observer to determine why one loan application is refused while an apparently similar one is accepted.

During the 1970s, banks and thrift institutions were charged with “redlining” in allocating credit. Many charged that lenders, in essence, drew a line (presumably red) around certain areas on a map and deliberately reduced the supply of mortgage and other credit to residents of those areas. Redlining was credited with both unfairly discriminating among those seeking credit and hastening the economic decline of the affected areas. Lenders, theoretically, did this because they were shortsighted, bigoted or insensitive to the needs of these individuals and communities.¹

In response to such charges, Congress passed the Community Reinvestment Act (CRA), effective November 6, 1978, to encourage financial institutions to meet the credit needs of their local communities. This article discusses redlining and examines the CRA experience during the three years of its existence. Since a study by the Council of State Planning Agencies has recommended enactment of

a law similar to the CRA, but aimed at increasing credit to small businesses in the bank’s community, this is an appropriate time to review the CRA experience.²

MORTGAGE MARKETS AND REDLINING

Economics of Mortgage Lending

The purchase of a home is typically the largest financial outlay that an individual makes in his lifetime, usually amounting to two or more years of a buyer’s income. Home purchasers generally rely on substantial credit to facilitate their purchases since they do not have sufficient savings readily available to buy the home outright.

By mid-1981 total mortgage debt in the country amounted to \$1.5 trillion, more than 50 percent greater than the total federal debt. This mortgage credit was granted by a vast number of diverse lenders. Savings and loan associations held 34 percent of the debt, commercial banks had 18 percent, life insurance companies carried 9 percent, and federal and related agencies held 8 percent. The remaining 31 percent of the mortgage debt was distributed among mutual savings banks, mortgage pools or trusts, relatives and other individuals,

¹*Take the Money and Run! Redlining in Brooklyn* (New York Public Interest Group, Inc., 1976), pp. 13-16; and *Redlined: A National Survey by National Peoples Action of Mortgage Lending Policies in the United States*, October 1976 (U.S. Senate Hearings, November 23, 1976, pp. 154-87).

²Beth K. Vogt, “Small Business Loan Act Urged,” *American Banker*, December 24, 1981.

mortgage companies, state and local credit agencies, credit unions and pension funds.

Because of the unique features of each property, the limited knowledge about borrowers outside the community, and legal restrictions on some lenders, most mortgage loans are granted by lenders located in the area of the property to be financed. Nevertheless, there is, in essence, a national mortgage market, and terms on mortgages vary only slightly between regions.

The broader market reflects the fact that some lenders, such as insurance companies, in searching for the most profitable opportunities, lend in various sections of the country. Also, mortgage bankers frequently resell mortgages to institutions situated in other parts of the country to enable them to make additional loans locally. FHA insurance and the secondary markets further improve the acceptance of mortgages outside the local community. In addition, savings tend to flow from areas of relatively low interest rates to areas of relatively higher interest rates. As a result, there is, in reality, a national mortgage market, bringing competition for mortgages into virtually every locality.

Since lenders are in business to maximize their wealth, it is natural for them to seek the most profitable loans available. It is rational, therefore, in determining whether to grant a loan, for lenders to consider such economic factors as the present and future value of the collateral, the income, wealth and other measures of the creditworthiness of the borrower, and the probable collection costs, in addition to the interest rate charged. On the other hand, it is irrational for lenders to refuse to lend for reasons unrelated to the likely profitability of the loan.

Theoretical Objections to the Existence of "Irrational" Redlining

To forego profitable opportunities by discriminating against potential borrowers on the basis of *non-economic* criteria is generally considered irrational behavior on the part of lenders. Imposing less favorable terms in one area than another, or refusing to lend altogether, when not justified by differences in risk or cost, is inconsistent with the self-interest of lenders or borrowers. If private lenders are profit maximizers, non-profitable redlining would be of limited duration.³ Although some lenders, at times,

³See Jack M. Guttentag and Susan M. Wachter, *Redlining and Public Policy*, Monograph Series In Finance and Economics, Monograph 1980-1 (New York University), p. 5.

may derive satisfaction from denying certain loans for non-economic reasons, competition from other lenders who seek such profitable loans assures that such actions are neither common nor widespread.

Despite its practical drawbacks, many believe that such redlining is common and that laws are needed to correct this abuse.⁴ These observers believe that many financial institutions exercise local monopoly power; thus the potential competition to reduce unprofitable redlining is severely limited. Hence, lenders allegedly have sufficient market power to indulge their lending prejudices for a considerable time. Although a lender with sufficient monopoly power can become lax or biased if he chooses, however, most monopolist lenders have pecuniary incentives to make the most profitable loans, incentives that are reinforced when management is accountable to stockholders. An exception, where prejudicial discrimination may be practiced without pecuniary cost, is a monopoly lender already so profitable that it fears public policy actions may be forthcoming if it becomes even more profitable.⁵ This does not appear to be a problem for mortgage lenders.

Is There Evidence that Redlining Exists?

The principal method of demonstrating the existence of redlining is to count mortgages made by certain lenders in an inner-city, low-income area and in a suburban, high-income area for about a year and compare the two figures.⁶ Such arguments were supported by data supplied by financial institutions under the Home Mortgage Disclosure Act. These data, combined with census information on housing, income and population, indicate that low-income areas receive proportionately less credit than other neighborhoods.

However, these studies have serious shortcomings. Most careful analyses have generally been consistent with the implications cited above for

⁴George J. Benston, "The Persistent Myth of Redlining," *Fortune* (March 13, 1978), pp. 66-69.

⁵See Armen A. Alchian and Reuben A. Kessel, "Competition, Monopoly, and the Pursuit of Money," *Aspects of Labor Economics* (National Bureau of Economic Research, 1962), pp. 157-83. Also, Alfred Nicols, "Stock Versus Mutual Savings and Loan Associations: Some Evidence of Differences in Behavior," *American Economic Review* (May 1967), pp. 337-46.

⁶See Michael Agelasto II and David Listokin, "Redlining in Perspective: An Evaluation of Approaches to the Urban Mortgage Dilemma," in Donald Phares, ed., *A Decent Home and Environment: Housing Urban America* (Ballinger Publishing Company, 1977).

profit-maximizing lenders. Two studies — for Sacramento, California and Louisville, Kentucky — demonstrated that arguments advanced to show redlining omitted many important sources of credit such as mortgage bankers and private funds.⁷ In an analysis of data provided by Toledo, Ohio, savings and loan associations, the demand for mortgages was also found to be an important omitted factor.⁸ A study of FHA insured mortgage foreclosures in six major cities which focused on the risks (costs) of lending on properties in alleged redlining areas found that differences in loan terms were based on economic rather than prejudicial factors.⁹ Allegations by community groups that properties in low-income areas were systematically underappraised were not supported in a study of savings and loan data for Miami, San Antonio and Toledo.¹⁰ On the other hand, an examination of denials of mortgage applications based on a survey of 176 banks by the Comptroller and the Federal Deposit Insurance Corporation (FDIC) found slight evidence of non-economic discrimination.¹¹

An in-depth study of the Rochester, New York, metropolitan area found insufficient evidence to conclude that redlining was a serious problem.¹² Its authors noted that previous inquiries claiming to find significant amounts of redlining made incomplete surveys of lenders (particularly mortgage bankers), ignored the effect of rent controls, used time periods too short for meaningful generalizations, ignored the collateral offered and the creditworthiness of borrowers, or did not compare demands for credit by areas.

Another extensive empirical analysis was made of virtually all home mortgage and home improvement loans granted in Cuyahoga County, the central county of the Cleveland area, from 1977 through 1979.¹³ After controlling for income and other demographic variables, the study concluded that neighborhood racial composition had little impact on either the total number of deed transfers financed by mortgage loans or total housing-related financing. However, it also appeared that the portion of conventional mortgage financing provided by banks and savings and loans was significantly lower in integrated and all-black neighborhoods than in all-white neighborhoods. On the other hand, black and racially mixed areas were significantly more likely to be served by mortgage bankers offering FHA and VA financing. Also, banks and savings and loans were much more likely to make home improvement loans in these areas.

One can obtain additional evidence that irrational redlining does not exist by looking at the operating history of new banks established primarily to lend in low-income areas. Twenty-six black-owned banks, for example, were established to serve this demand in low-income areas in the last 10 years. Of these new banks, five have failed, and at least a dozen others were near collapse before other organizations bailed them out.¹⁴ Although minority banks came into existence to deal with specific minority credit problems, their lack of success suggests that most creditworthy demands were already being accommodated, although other factors such as management and capitalization may also have played a role.

Further tests of banks' lending behavior support the profit-maximization model. One recent study, using data on 30,000 commercial bank consumer loans, tested whether sex discrimination existed in credit allocation by banks.¹⁵ The study found no systematic pattern of sex discrimination — even before the Equal Credit Opportunity Act was passed. Instead, banks typically behaved as profit maximizers, making loans on equivalent terms to equally risky customers, regardless of their sex.

⁷Dennis Dingemans, "Redlining and Mortgage Lending in Sacramento," *Annals of the Association of American Geographers* (June 1979), pp. 225-39; and Theodore Koebel, *Housing in Louisville: The Problems of Disinvestment* (Urban Studies Center, University of Louisville, 1978).

⁸James R. Ostas, J. David Reed, and Peter M. Hutchinson, "An Intertemporal Comparison of Urban Mortgage Lending Patterns in the Toledo, Ohio SMSA: 1977 vs. 1975," Unpublished paper (Bowling Green State University, 1979).

⁹Richard G. Marcis and Everson W. Hull, "Analysis of the Socio-Economic Determinants of Foreclosures on 2219(d)(2) and 235 Mortgages," Federal National Association Meeting, 1975.

¹⁰A. Thomas King, "An Analysis of Mortgage Lending in Three SMSA's," Office of Economic Research, Federal Home Loan Bank Board (preliminary report, 1979).

¹¹Harold Black, Robert L. Schweitzer and Lewis Mandell, "Discrimination in Mortgage Lending," *American Economic Review* (May 1978), pp. 186-91.

¹²George J. Benston, Dan Horsky, and H. Martin Weingartner, *An Empirical Study of Mortgage Redlining*, Monograph Series In Finance and Economics, Monograph 1978-5 (New York University).

¹³Robert B. Avery and Thomas M. Buynak, "Mortgage Redlining: Some New Evidence," *Economic Review*, Federal Reserve Bank of Cleveland (Summer 1981), pp. 18-32.

¹⁴Michael L. King, "Black-Owned Banks Facing Doubts About Their Continued Usefulness," *The Wall Street Journal*, August 10, 1981.

¹⁵Richard L. Peterson, "An Investigation of Sex Discrimination in Commercial Bank Direct Consumer Lending," *The Bell Journal of Economics* (Autumn 1981), pp. 547-61.

THE COMMUNITY REINVESTMENT ACT

Despite theoretical objections and the lack of evidence that such redlining actually existed, Congress passed the CRA. The congressional action generally reflected the public's sympathy with the anecdotal arguments of those living in blighted areas. The success of community groups in convincing the press and public that lenders were not serving older urban areas was primarily the result of skillful publicity rather than substantial confirming evidence.¹⁶ The act was intended to eliminate irrational redlining in determining whether a loan application is accepted; lenders were still permitted to evaluate applications on rational economic grounds.

The act specifically requires financial institutions to "... demonstrate that their deposit facilities serve the convenience and needs of the communities in which they are chartered to do business." It directs four regulatory agencies — the Board of Governors of the Federal Reserve System, the Comptroller of the Currency, the Federal Home Loan Bank Board (FHLBB), and the FDIC — to encourage each institution under their jurisdiction to help meet the credit needs of its entire local community.

Under the act, a financial institution is required to adopt a CRA statement, maintain public CRA files and display a CRA notice, which includes information on the availability of the institution's CRA statement. The CRA statement must include a delineation of the area that comprises the institution's community and a list of principal types of credit that the institution is prepared to extend. The public files must contain any signed comments received from the public about the institution's record of serving the credit needs of its community.

In addition, the CRA requires the regulatory agencies to assess regularly each institution's record of meeting the credit needs of its community, including low-to-moderate income neighborhoods, consistent with the safe and sound operation of the institution. These assessments are taken into account in rulings on merger, holding company and other applications by the institution. Also, the CRA offers anyone the opportunity to challenge any merger, holding company or branching expansion

plans of financial institutions that are considered unresponsive to the credit demands of their community.

Protests Under the CRA

To date, about 100 protests in opposition to the applications of banks and savings and loans on CRA grounds have been filed with the regulatory agencies. Most have been lodged by community organizations, a few have come from the press or individuals, and approximately one-third have been lodged by competitors. Most protests have been against institutions located in or near low-income areas of major cities.

At first, community groups were hesitant about using the CRA to challenge applications, perhaps because of their unfamiliarity with the operations of financial institutions and regulatory agencies and because most creditworthy demands were being accommodated. Over time, these organizations have gained experience and become more active. A number of protests have been supported by considerable information; these have frequently been instrumental in gaining concessions from financial institutions.¹⁷

Although there are several technical requirements in the CRA, such as displaying a CRA notice in the lobby, protesters have had little complaint concerning them. The chief issue raised in most protests is the failure of the financial institution to serve adequately the housing-related credit requirements of low-income neighborhoods, especially those composed of minorities or those with a shifting racial balance. These complaints typically contend that the lending institution systematically refuses or severely limits credit to certain neighborhoods because of location, age of property or general conditions in the area, with little regard to the creditworthiness of the applicant.

Protests also have been registered on other grounds. These include: the institutions' failure to advertise the availability of credit in the lower income neighborhoods; a low level of involvement with government programs, particularly the Small Business Administration and the student loan programs; excessively restrictive mortgage loan policies, such as larger down payments than other

¹⁶See George J. Benston, "Mortgage Redlining Research: A Review and Critical Analysis Discussion," *The Regulation of Financial Institutions*, Conference Series No. 21 (Federal Reserve Bank of Boston and the National Science Foundation, 1979), pp. 114-95.

¹⁷See Thomas M. Buynak, "The Community Reinvestment Act: Early Experience and Problems," *Economic Commentary*, Federal Reserve Bank of Cleveland, April 20, 1981.

lenders in the community require; pre-screening of potential loan applicants; and inadequate efforts to ascertain "community credit needs."

Regulatory Response to the CRA

Congress provided little specific guidance in the act as to what is satisfactory or unsatisfactory performance in regard to community reinvestment. The act does not explain how a financial institution's community should be selected, how credit needs are to be determined, what constitutes low- and moderate-income neighborhoods, or to what extent the act was to be interpreted by considering the costs, liquidity, safety and profitability of the lender. Since the provisions of the act are vague, regulatory agencies have had to both enforce the act and interpret it as well.

The regulatory agencies invited the public to suggest how to interpret and implement the act in a series of hearings held in cities across the nation.¹⁸ To provide a focus for the hearings, a number of questions that the statute raised were included with the public notice of the hearings.¹⁹ Consequently, the implementation of the act began modestly and cautiously and has been gradually formulated over time. The agencies, evolving their own standards on a case-by-case basis, have examined a variety of evidence in evaluating a lender's CRA performance.²⁰

Under the CRA, regulatory agencies have a number of responsibilities. They must regularly assess each lending institution's record of performance in helping to meet its community credit needs. This assessment or inspection covers both the technical compliance with regulations and a qualitative evaluation of the institution's overall performance in serving the credit requirements of its community. The regulatory agencies have agreed on a uniform rating system to provide a consistent application of the act. However, they assigned no explicit weights

Table 1
CRA Examination Ratings of Member Banks During 1980

Rating	Number of banks	Percentage of banks
1 - Outstanding	31	3.5%
2 - Good	328	36.7
3 - Satisfactory	507	56.7
4 - Needs improvement	26	2.9
5 - Unsatisfactory	2	0.2
TOTAL	894	100.0

to the assessment factors, since they believed that any such weighting would constrain an institution's responses to local credit demands.

A significant aspect of the CRA inspection is an overall judgmental evaluation of a lender's performance in meeting the credit demands of its community. CRA inspections of a given bank occur roughly every 12 to 18 months and, by and large, have revealed that the banks served the credit needs of their communities (table 1).²¹ Even in cases of unsatisfactory performance, most potential borrowers were protected by other competitive institutions in the area.

Regulatory agencies take into account both the CRA assessments and actions taken by the lender to bring about future improvement when they evaluate an institution's application for a charter, branch, office relocation, deposit insurance, merger or acquisition. The agencies will deny any application if they judge that the bank or savings and loan has not complied with the substantive provisions of the CRA.

Also, since the public may challenge a financial institution's application on CRA grounds, the agencies must evaluate the merits of CRA protests and objections when considering an institution's application. To aid protestors, the Federal Reserve System issued Regulation BB, which lists the criteria the Board of Governors considers in evaluating the CRA record of a bank (see insert). In addition, each Reserve Bank has appointed a Community Affairs Officer whose responsibilities include advising

¹⁸See statement by Philip C. Jackson Jr., *Federal Reserve Bulletin* (August 1978), pp. 631-33.

¹⁹See "Community Reinvestment Act of 1977 to Be Implemented," *Federal Reserve Bank of Dallas Voice* (March 1978), p. 12, for questions posed. Also, see "Community Reinvestment Act Hearing Held at Fed," *Federal Reserve Bank of Dallas, Voice* (May 1978), pp. 22-24, for a sampling of the mixed comments received at the public hearings.

²⁰Glenn Canner and Joe M. Cleaver, "The Community Reinvestment Act: A Progress Report," *Federal Reserve Bulletin* (February 1980), pp. 87-96.

²¹Glenn Canner, "The Community Reinvestment Act: A Second Progress Report," *Federal Reserve Bulletin* (November 1981), pp. 813-18.

community groups and banks on procedures to follow in CRA disputes.

To date, only four applications have been denied on CRA grounds. Three rejections were by the FDIC, two involving branch applications and one a merger. The fourth denial was by the Comptroller of the Currency. The three FDIC cases followed protests by community groups; in the other cases, there was no protest. Three of these cases were subsequently approved after specific actions by the institutions — such as hiring a full-time community relations officer, improving its marketing programs and

committing specific amounts of funds for mortgage and home improvement loans in low-to-moderate income neighborhoods — improved their CRA performance.

The relatively few denials under the CRA, however, is not a reliable measure of the effect of the act on bank lending practices. Because of the act, a number of institutions have changed certain lending practices, and many approvals of applications have been based on commitments to improve CRA performance. Of the 19 protested cases approved by the

Assessing the Record of Performance Regulation BB, Section 228.7

In connection with its examination of a State member bank, the Board shall assess the record of performance of the bank in helping to meet the credit needs of its entire community, including low- and moderate-income neighborhoods, consistent with safe and sound operation of the bank. The Board will review the bank's CRA Statement(s) and any signed, written comments retained by the State member bank or the Federal Reserve Bank. In addition, the Board will consider the following factors in assessing a bank's record of performance:

(a) Activities conducted by the State member bank to ascertain the credit needs of its community, including the extent of the bank's efforts to communicate with members of its community regarding the credit services being provided by the bank;

(b) The extent of the State member bank's marketing and special credit-related programs to make members of the community aware of the credit services offered by the bank;

(c) The extent of participation by the State member bank's board of directors in formulating the bank's policies and reviewing its performance with respect to the purposes of the Community Reinvestment Act;

(d) Any practices intended to discourage applications for types of credit set forth in the State member bank's CRA Statement(s);

(e) The geographic distribution of the State member bank's credit extensions, credit applications, and credit denials;

(f) Evidence of prohibited discriminatory or other illegal credit practices;

(g) The State member bank's record of opening and closing offices and providing services at offices;

(h) The State member bank's participation, including investments, in local community development and redevelopment projects or programs;

(i) The State member bank's origination of residential mortgage loans, housing rehabilitation loans, home improvement loans, and small business or small farm loans within its community, or the purchase of such loans originated in its community;

(j) The State member bank's participation in governmentally-insured, guaranteed, or subsidized loan programs for housing, small businesses, or small farms;

(k) The State member bank's ability to meet various community credit needs based on its financial condition and size, and legal impediments, local economic conditions, and other factors; and

(l) Other factors that, in the Board's judgment, reasonably bear upon the extent to which a State member bank is helping to meet the credit needs of its entire community.

Board of Governors, commitments have played a role in seven.²²

It is the explicit policy of the regulatory agencies to encourage discussion between applicants and protestants to help resolve or narrow their differences. A number of such discussions have been held, and, in six protested cases decided by the Board of Governors, a privately negotiated agreement between the parties was a factor in resolving the problem. These discussions resulted in commitments by financial institutions to change lending practices and other policies. At times, in private agreements between the parties, lenders have gone much further than the act requires, for example, by allocating specific amounts of mortgage credit in certain depressed areas at interest rates of ½ percentage point below the prevailing market rate.²³

EVALUATION OF THE CRA

The CRA has been controversial from its inception. Prior to its passage, community groups claimed that irrational redlining was common, while financial institutions asserted that they were meeting neighborhood credit demands consistent with prudent lending practices. There is little agreement, however, on the extent of the problem, though most careful studies have found little discrimination in lending. Consequently, the desirability of the act and the role, if any, that it should play in credit markets is still in doubt after three years. The American Bankers Association has requested Congress to repeal the CRA.²⁴

Even if some managers of financial intermediaries were willing to forego profits to satisfy their prejudices, the sizable numbers of lenders operating in most local markets, especially in the major cities where redlining is alleged to be greatest, makes it unlikely that many actual cases of credit unavailability on competitive terms would be observed. The experience of the last three years has been consistent with many economists' views that the lack of credit availability to borrowers caused by irrational redlining is uncommon. Yet, also as expected, the act has placed a burden on lenders, which has caused

some reallocation of credit and increased the costs of financial intermediation.

The philosophy incorporated in the CRA of requiring each financial institution to give preference in its lending to those in their local community can be questioned. Financial institutions, their stockholders and their depositors are clearly better off if funds are loaned where the interest rates are higher, regardless of location. Similarly, the prospects for increased investment and production are enhanced when credit is allocated efficiently. Competition among lenders, the borrowers' best protection against prejudiced lenders, is strengthened when financial institutions seek to make the best loans possible.

Some analysts regarded the passage of the act as a major step toward governmental allocation of credit. Such concern still exists, even though the regulatory agencies deny that the act and its enforcement allocates credit.²⁵ In fact, the Federal Reserve has stated that it will not endorse any agreements to allocate credit.²⁶ Yet, when financial institutions desire favorable rulings on applications, and, as part of this process, must demonstrate that the credit needs of low-to-moderate income areas are being adequately served, credit will be allocated differently, if for no other reason than to increase the probability of a favorable ruling. Thus, some financial institutions have adjusted their lending policies to grant more credit in low-to-moderate income areas in their communities.

Another result of the act is that financial institutions have undertaken large projects in which financial risks can be shared. One example of such efforts was in Springfield, Massachusetts, where 11 local commercial and savings banks and two insurance companies combined development efforts to revi-

²⁵The Federal Reserve has stated, "Although CRA is directed at the problem of meeting sound community credit needs, it was not intended to establish a regulatory influence on the allocation of credits. In implementing the Act, the Board has acted on the belief that banks are in the best position to assess the credit needs of their own local communities . . ." Federal Reserve System, Community Reinvestment Act, Information Statement, January 3, 1980, p. 1.

²⁶(The Board) ". . . is aware that many banks have on their own initiative adopted special purpose credit programs, or pilot programs to test new credit offerings. The Board does not wish to discourage these efforts. However, the Board will closely scrutinize any agreements to ascertain that they are not inconsistent with the safety and soundness of the bank involved, and do not establish a preference for credit extensions inconsistent with evenhanded treatment of borrowers . . ." Federal Reserve System, Community Reinvestment Act, Information Statement, January 3, 1980, p. 3.

²²*Ibid.*

²³See the order in the Landmark case, News Release, Federal Reserve Bank of St. Louis, November 30, 1979.

²⁴"ABA Calls For Repeal of CRA; High Costs are Cited," *American Banker*, December 11, 1981. The ABA contends that costs far exceed the benefits of CRA, and the act merely requires what good sense dictates anyway — serving the communities.

talize the downtown area.²⁷ The longer-run anti-competitive implications of creating what are essentially lending cartels, however, may be unfavorable for borrowers.

An evaluation of the net impact on the community of CRA-type agreements and commitments by financial institutions to community groups is difficult. Perhaps borrowers in low-to-moderate income areas have received somewhat more credit than they would have otherwise received. The costs to depositors, stockholders and other potential borrowers, however, are largely hidden. To the extent that contacts with community groups improve the banker's knowledge of loan opportunities and risks, and generates new sources of sound loans at current market rates, such activities improve the financial system while removing some inequities. To the extent that bankers engage in these activities merely to create harmonious public relations, they merely increase the costs of financial intermediation.

The costs imposed by the CRA on financial intermediation have run into many millions of dollars. The expense of adopting formal policy statements,

²⁷See "Investing in the Future of America's Cities: The Banker's Role," *Six Case Studies*, prepared by the National Council on Urban Economic Development for the Office of the Comptroller of the Currency, Community Development Division.

appointing community relations officers, familiarizing employees with the legal requirements, holding meetings with community groups, record keeping and reporting must be financed by each lending institution. The administrative costs of the regulatory agencies in periodically assessing each financial institution's CRA performance and in applying CRA standards in the review of each application is a burden on taxpayers. A protested CRA application generates the additional costs of preparing a defense and often delays for six months or more the outcome of the application.

Some have expressed concern that the CRA eventually will reduce the supply of credit in low-income neighborhoods. A study prepared for the FHLBB found that the act shifted housing-related credit into certain central-city areas, but only in the short run.²⁸ The regulations also raise costs more sharply for lenders serving these localities, which could eventually result in a reduction in the supply of such credit. With less credit available, it becomes more expensive, adversely affecting the low-income areas. Also, when allegation of CRA violations come from competitive institutions seeking to prevent or delay a market entrant, the flow of credit to the local area is impeded, an outcome presumably opposite to the act's intent.

²⁸Guttentag and Wachter, "Redlining and Public Policy."



The Shift in Money Demand: What Really Happened?

R. W. HAFFER AND SCOTT E. HEIN

THE money demand function is a key relationship in conventional macroeconomic models. When it appeared that during the mid-1970s the conventional specification had undergone an unforeseen shift, analysts devoted considerable ingenuity and research effort to testing alternative explanatory variables that would account for the change.¹ Some specifications have produced marginally superior forecasting results. None, however, has been successful in explaining the post-1974 behavior of money demand.

Discussions of the temporal stability of parameters in econometric models generally differentiate between two distinct types of shift. One type of shift is an intercept, or level, shift, in which the estimated relationship simply undergoes a parallel change that leaves all marginal (slope) coefficients unaffected. The other type of shift occurs when at least

one of the relative slope coefficients changes. Surprisingly, previous examinations of the money demand puzzle have not explicitly investigated this basic distinction. The approach used in most previous work has been to presume that the change was not necessarily parametric, but due to the exclusion of an important variable. Hence, most studies focused on searching for the "correct" scale or opportunity cost measures to be used in the relationship.²

Given the unsuccessful nature of this approach, we consider a different tack. The purpose of this article is to study explicitly the nature of the shift in money demand. The evidence suggests that the conventional money demand specification was subject to a once-and-for-all *level* shift during the mid-1970s. Our results further suggest that the economic relationship underlying the estimated slope coefficients of the conventional equation remained remarkably stable throughout the turbulent 1960-79 period. This result conflicts directly with much previous research.

The format of the paper is as follows: First, the apparent deterioration in the standard specification for M1 during the I/1960-IV/1979 period is documented.³ Then, a procedure to determine likely point(s) of intercept change(s) in the money demand function is suggested and implemented. Finally, the implications of our findings are presented.

¹See, for example, Michael J. Hamburger, "Behavior of the Money Stock: Is There a Puzzle?" *Journal of Monetary Economics* (July 1977), pp. 265-88; Gillian Garcia and Simon Pak, "Some Clues in the Case of the Missing Money," *American Economic Review* (May 1979), pp. 330-34, and "The Ratio of Currency to Demand Deposits in the United States," *Journal of Finance* (June 1979), pp. 703-15; Richard D. Porter, Thomas D. Simpson and Eileen Mauskopf, "Financial Innovation and the Monetary Aggregates," *Brookings Papers on Economic Activity* (I:1979), pp. 213-29; H. Robert Heller and Mohsin S. Khan, "The Demand for Money and the Term Structure of Interest Rates," *Journal of Political Economy* (February 1979), pp. 109-29; David J. Bennett, Flint Brayton, Eileen Mauskopf, Edward K. Offenbacher and Richard D. Porter, "Econometric Properties of the Redefined Monetary Aggregates," Board of Governors of the Federal Reserve System, Division of Research and Statistics (February 1980), processed; G. S. Laumas and David E. Spencer, "The Stability of the Demand for Money: Evidence from the Post-1973 Period," *Review of Economics and Statistics* (August 1980), pp. 455-59; and Thomas D. Simpson and Richard D. Porter, "Some Issues Involving the Definition and Interpretation of the Monetary Aggregates," in *Controlling the Monetary Aggregates III*, Conference Series No. 23, (Federal Reserve Bank of Boston, 1980), pp. 161-234.

²For a critical analysis of attempts to repair the conventional specification, see R. W. Hafer and Scott E. Hein, "Evidence on the Temporal Stability of the Demand for Money Relationship in the United States," this *Review* (December 1979), pp. 3-14.

³The 1960-79 period is used to focus attention explicitly on the problems associated with money demand estimations through the mid-1970s. Estimation of the function through 1980 and 1981 would necessitate allowances for the possible effects of the credit control program and the change in Federal Reserve operating procedures. Such analysis would divert attention from the previously unresolved issue.

Table 1
Regression Results for Equation 1

Period	Coefficient ¹					Summary statistics ²			
	Constant	y_t	RCP_t	RCB_t	$(M/P)_{t-1}$	\bar{R}^2	$SE(x10^{-3})$	h	rho
I/1960-IV/1973	-0.610 (2.82)	0.125 (2.69)	-0.016 (3.02)	-0.032 (2.08)	0.778 (6.02)	0.967	3.96	1.78	0.31
I/1960-IV/1979	-0.275 (2.35)	0.057 (2.51)	-0.019 (3.45)	-0.039 (1.79)	0.962 (13.55)	0.874	5.27	-0.87	0.55

¹All variables enter logarithmically. The log-level equation is estimated using Hatanaka's procedure. The numbers in parentheses are absolute values of t-statistics.

² \bar{R}^2 is the coefficient of determination corrected for degrees of freedom, SE is the standard error of the estimated equation, h is the Durbin h-statistic and rho is the Hatanaka estimate of the autocorrelation coefficient.

THE SHIFT IN THE MONEY DEMAND FUNCTION: A REVIEW OF THE PROBLEM

The conventional money demand specification is

$$(1) \ln (M/P)_t = \alpha_0 + \beta_1 \ln y_t + \beta_2 \ln RCP_t + \beta_3 \ln RCB_t + \beta_4 \ln (M/P)_{t-1} + \epsilon_t,$$

where M represents the narrow definition of money (new M1),⁴ P is the implicit GNP deflator (1972=100), y is real GNP (1972 dollars), RCP is the commercial paper rate and RCB is a weighted average of the commercial bank passbook rate. While many different money demand equations have been estimated, equation 1 is generally the standard used for comparison.

Initial estimates of equation 1 revealed a significant degree of first-order serial correlation in the error process. Previous estimates of equation 1 gen-

erally have corrected this problem through the use of the Cochrane-Orcutt iterative procedure. This approach, however, yields inefficient coefficient estimates in the presence of a lagged dependent variable.⁵ Therefore, to obtain estimates that are (asymptotically) efficient and consistent, Hatanaka's residual adjusted Aitken estimation procedure is used in this study.⁶

Table 1 presents estimates of equation 1 for the I/1960-IV/1973 and I/1960-IV/1979 sample periods. The estimates for the earlier sample period are quite similar to those of other studies. These estimates suggest that real money balances adjust toward their equilibrium levels at the rate of about 22 percent per quarter, *ceteris paribus*. The esti-

⁵Roger Betancourt and Harry Kelejian, "Lagged Endogenous Variables and the Cochrane-Orcutt Procedure," *Econometrica* (July 1981), pp. 1073-78; and Michio Hatanaka, "An Efficient Two-Step Estimator for the Dynamic Adjustment Model with Autoregressive Errors," *Journal of Econometrics* (September 1974), pp. 199-220. It has been shown also that the Cochrane-Orcutt procedure may not iterate to a global minimum of the regression standard error. See R. W. Hafer and Scott E. Hein, "The Dynamics and Estimation of Short-Run Money Demand," this *Review* (March 1980), pp. 26-35.

⁶Previous money demand studies using the Hatanaka procedure include Charles Lieberman, "The Long-Run and Short-Run Demand for Money, Revisited," *Journal of Money, Credit and Banking* (February 1980), pp. 43-57; Laumas and Spencer, "Stability of the Demand for Money;" and Stuart D. Allen and R. W. Hafer, "Money Demand and the Term Structure of Interest Rates: Some Consistent Estimates," *Journal of Monetary Economics* (forthcoming).

For an examination of the Hatanaka procedure vis-a-vis Cochrane-Orcutt, Hildreth-Lu and maximum-likelihood estimation techniques, see Edward K. Offenbacher, "A Comparison of Alternative Estimators of a 'Standard' Money Demand Equation," Special Studies Paper No. 157 (Board of Governors of the Federal Reserve System, July 1981).

⁴In response to a changing financial environment, the monetary aggregates were redefined. Thus, checkable deposits can now take the form of negotiable orders of withdrawal (NOW), automatic transfer system (ATS) and credit union share draft accounts. The old M1 measure has been augmented by the introduction of these deposits. To the extent that this empirical redefinition of the "transactions" measure of money is induced by the advent of near-money substitutes, the use of old M1 may reveal unstable relationships. Whether other financial innovations, such as money market mutual funds, repurchase agreements, overnight Eurodollars and the like, impinge upon the estimation of equation 1 is an empirical matter to be addressed below. Indeed, this line of reasoning has been used to explain the poor post-1973 performance of equation 1. See Garcia and Pak, "Some Clues in the Case of the Missing Money" and "The Ratio of Currency to Demand Deposits," and Porter, Simpson and Mauskopf, "Financial Innovation," for examples of such arguments.

mated elasticities also are similar to other estimates. For example, the estimated long-run income elasticity is 0.56, a value that roughly coincides with the theoretical value given by a simple transactions demand framework.⁷ Finally, the summary statistics indicate that a large amount of the variation in real money balances is captured by the right-hand variables, and the error process appears well-behaved.

The regression results for the I/1960-IV/1979 period are quite unlike those of the I/1960-IV/1973 period. The estimated short-run income elasticity is halved, while the coefficient on the lagged dependent variable increases markedly. The estimated speed of adjustment (0.04 percent) from the I/1960-IV/1979 results indicates that the mean adjustment lag exceeds 26 quarters, considerably different from that for the pre-1974 period (4.5 quarters). Moreover, the estimated long-run income elasticity for the full period is now 1.50, three times the estimate obtained from the earlier sample period.

The I/1960-IV/1979 estimates seem to support the claim that the money demand relationship has been altered. The regression evidence presented in table 1 suggests that the estimated coefficients have shifted dramatically. Moreover, a standard F-test for structural stability allows one to reject the hypothesis of stable regression coefficients across the commonly hypothesized IV/1973 break point: The calculated F-statistic of 4.51 exceeds the 5 percent critical value of 2.23.⁸

Further evidence of the breakdown is demonstrated by an analysis of the equation's forecasting ability. Post-sample static forecasts for the natural log of real money balances are presented in table 2.⁹ These forecasts are based on the coefficient estimates from the I/1960-IV/1973 regression. The results in table 2 indicate a continual overprediction of real money balances. The Theil bias coefficient

⁷See William J. Baumol, "The Transactions Demand for Cash: An Inventory Theoretic Approach," *Quarterly Journal of Economics* (November 1952), pp. 545-56; and Robert J. Barro, "Integral Constraints and Aggregation in an Inventory Model of Money Demand," *Journal of Finance* (March 1976), pp. 77-78.

⁸This test is complicated by the presence of first-order serial correlation. In the results reported, the serial correlation coefficient (ρ) is allowed to vary across subperiods.

⁹Those familiar with the recent money demand literature may find it surprising that *static* rather than *dynamic* forecasts are employed. The latter technique yields an exaggerated picture of the shift in a relationship without proper interpretation. Consequently, the more widely understood static forecasting procedure is employed in this paper. See Scott E. Hein, "Dynamic Forecasting and the Demand for Money," this *Review* (June/July 1980), pp. 13-23.

Table 2
Post-Sample Static Simulation Results:
I/1974-IV/1979

Log-level specification ¹	
Year and Quarter	Forecast error (x10 ⁻²)
1974 I	0.02
II	-1.28
III	-1.29
IV	-1.60
1975 I	-2.28
II	-0.68
III	-1.32
IV	-2.51
1976 I	-1.32
II	-1.30
III	-2.22
IV	-1.75
1977 I	-1.48
II	-2.25
III	-1.85
IV	-1.36
1978 I	-1.49
II	-2.41
III	-1.86
IV	-2.26
1979 I	-2.66
II	-1.21
III	-1.49
IV	-2.31
Summary statistics ²	
RMSE	1.782 (x10 ⁻²)
U ^M	0.882
U ^S	0.010
U ^C	0.109

¹The forecast errors (actual less predicted) are logs of M1 (billions of 1972 dollars). They are obtained from simulating equation 1 and are based on coefficient estimates in table 1.

²RMSE is the root-mean-squared error in terms of real money balances (billions of 1972 dollars) for the log-level specification. U^M is the Theil bias coefficient, U^S the variance coefficient and U^C the covariance coefficient. For an explanation of these statistics, see Theil, *Applied Economic Forecasting*.

(U^M) indicates that almost 90 percent of the forecast error is attributable to bias, that is, one-sided prediction errors.¹⁰ Moreover, the root-mean-squared error (RMSE) of 0.01782 is more than four times the in-sample standard error.

¹⁰For a complete description of the derivation and interpretation of the Theil coefficients, see Henri Theil, *Applied Economic Forecasting* (Amsterdam; North Holland Publishing Co., 1966), pp. 27-32.

CHOOSING BETWEEN INTERCEPT AND SLOPE SHIFTS

The preceding evidence suggests that the parameter estimates of equation 1 from the 1960-79 period no longer represent a viable empirical model of short-run money demand. Obviously, "some sort of shift has occurred."¹¹ The question is, "What *type* of shift has occurred?" If the estimated slope coefficients have changed, this implies changes in the underlying economic relationship (i.e., between real money balances and real income or interest rates). While the estimates of the slope coefficients show marked change over the two periods in table 1, the true slope coefficients may not have actually changed. If, instead, an intercept shift occurred during the mid-1970s, then empirical estimates of equation 1 for the I/1960-IV/1979 sample period may be seriously biased because of the failure to account for the level shift in the relationship, which produces a "missing variable" problem.¹² Consequently, if the slope coefficient estimates are biased, they could lead a researcher to falsely reject the hypothesis of slope coefficient stability.

The major difficulty with an analysis of intercept shifts is in pinpointing exactly when the shift(s) occurred. A useful procedure to determine the likely points of an intercept or slope shift is to re-estimate equation 1 in first-difference form.¹³ First-differencing equation 1 yields

$$(2) \Delta \ln (M/P)_t = \beta_1 \Delta \ln y_t + \beta_2 \Delta \ln RCP_t + \beta_3 \Delta \ln RCB_t + \beta_4 \Delta \ln (M/P)_{t-1} + \Delta \epsilon_t,$$

where Δ is the first-difference operator.

Equation 2 provides useful diagnostic information in the event of an intercept shift in the level equation. For example, a once-and-for-all intercept shift in equation 1 will appear as a one-time increment in the disturbance pattern of the first-difference specification.¹⁴ Moreover, changes, if any, in the slope coefficients in equation 1 also will appear in

¹¹Stephen M. Goldfeld, "The Case of the Missing Money," *Brookings Papers on Economic Activity* (3:1976), p. 726.

¹²Excluding a relevant variable, in this case the intercept shift term, may bias not only the coefficient estimates, but also the estimate of the residual variance. On this point, see G. S. Maddala, *Econometrics* (McGraw-Hill, 1977), pp. 155-57.

¹³A more complete discussion of this derivation appears in R. W. Hafer and Scott E. Hein, "Investigating the Shift in Money Demand: An Econometric Analysis," in *Empirical Studies of Money Demand: Proceedings of a Conference Held at the Center for the Study of American Business*, Working Paper No. 70 (Center for the Study of American Business, Washington University, August 1981), pp. 1-28.

equation 2. If, as many have argued, the marginal relationships embodied in equation 1 have changed, the first-difference specification also will exhibit similar changes in the coefficient estimates. Thus, the first-difference specification serves a dual purpose: It can locate the most likely points of an intercept shift, and it provides evidence on whether the slope coefficients have changed.

To locate and test for potential intercept shifts, the following procedure was adopted: The I/1960-IV/1979 first-difference specification (equation 2) was estimated using ordinary least squares, the residuals were plotted over time and the large residual "outliers" were selected.¹⁵ Based on this procedure, three points were identified and selected as candidates for points of intercept shift: II/1974, IV/1975 and II/1979. The first two residuals were negative, suggesting downshifts in the log-level money demand equation. The II/1979 residual was positive, suggesting an upshift. Equation 1 was estimated (again using the Hatanaka procedure) assuming one-time shifts at those points using (0,1) intercept dummy variables: D1=1 for I/1960-I/1974, 0 otherwise; D2=1 for II/1974-III/1975, 0 otherwise; and D3=1 for IV/1975-IV/1979, 0 otherwise.

Preliminary significance tests revealed that only the II/1974 intercept shift term was statistically significant at the 5 percent level. Consequently, we report the version of equation 1 that incorporates

¹⁴This increment will be noticeable if the intercept shift is "sufficiently large" relative to the variance of the disturbances. Thus, the residuals of equation 2 are examined to determine the likely point at which "large" shifts occurred.

¹⁵The focus of this article concerns the possible intercept shift in the log-level money demand equation. Consequently, the reader is referred to Hafer and Hein, "Investigating the Shift in Money Demand," for a more detailed analysis of the first-difference estimation results. To give the reader some idea of the outcome, the OLS estimates of equation 2 for the I/1960-IV/1979 period are (absolute value of t-statistics in parentheses)

$$\begin{aligned} \Delta \ln (M/P)_t = & 0.190 \Delta \ln y_t - 0.017 \Delta \ln RCP_t \\ & (3.51) \qquad (2.94) \\ & - 0.038 \Delta \ln RCB_t + 0.562 \Delta \ln (M/P)_{t-1} \\ & (1.68) \qquad (5.70) \end{aligned}$$

$$\bar{R}^2 = 0.448 \qquad SE = 0.005 \qquad h = 0.47$$

Not only do the coefficient estimates appear reasonably close to the pre-1974 estimates, but *ex post* forecasts indicate a substantial improvement in the pattern. The resultant RMSE is well within two standard errors of the equation's in-sample standard error and the Theil decomposition statistics indicate that only 7 percent of the forecast error is attributable to bias. Moreover, an F-test for structural change at IV/1973 yields an F-value of 0.06.

For a discussion of these results, see Edward K. Offenbacher, "Discussion of the Hafer and Hein, Smirlock and Webster Papers," in *Empirical Studies of Money Demand*, pp. 88-106.

only the II/1974 intercept shift variable (D1). The resulting coefficient estimates are (absolute value of t-statistics in parentheses)¹⁶

$$\begin{aligned}
 (3) \ln(M/P)_t = & -0.406 + 0.013 D1 + 0.076 \ln y_t \\
 & (3.95) \quad (2.88) \quad (3.83) \\
 & -0.021 \ln RCP_t - 0.020 \ln RCB_t \\
 & (4.84) \quad (1.28) \\
 & + 0.917 \ln(M/P)_{t-1} \\
 & (16.09) \\
 \bar{R}^2 = 0.960 \quad SE = 0.0048 \quad h = -0.05 \quad \hat{\rho} = 0.24
 \end{aligned}$$

These results support the contention that the marginal relationships in the short-run money demand equation were not altered as much as previous evidence suggests. The evidence, however, points to the existence of a significant, once-and-for-all downward *level* shift in the relationship in II/1974.

The regression results indicate that the constant term in the log-level specification decreased from -0.406 for the I/1960-I/1974 period to -0.419 in II/1974. This change (0.013) is small relative to the standard error of the coefficient estimate. It is, however, almost three times as large as the standard error of the regression (0.0048) for the I/1960-IV/1973 period. Thus, its exclusion significantly affects the full-sample, level estimation.

A superficial comparison of the shift-adjusted, log-level estimates with those for the I/1960-IV/1973 sample period in table 1 suggests that the slope coefficients may have changed across the period tested. The question to be addressed now is, once the downward displacement of the constant term has been accounted for, have the slope coefficients changed statistically? To formally test this hypothesis, equation 3 was re-estimated for the full sample period with the individual slope coefficients allowed to take on different values in the two separate sub-periods. Zero-one dummy variables again were used to delineate the relevant subsamples (I/1960-I/1974 and II/1974-IV/1979): the dummy variables are D1=1 in I/1960-I/1974, 0 otherwise; and D2=1 in II/1974-IV/1979, 0 otherwise. The estimated equation using both the intercept and slope

dummy variables is (absolute value of t-statistics in parentheses)¹⁷

$$\begin{aligned}
 \ln(M/P)_t = & -0.482 - 0.008 D1 + 0.099 D1 \ln y_t \\
 & (2.76) \quad (0.53) \quad (2.61) \\
 & + 0.124 D2 \ln y_t - 0.018 D1 \ln RCP_t \\
 & (3.69) \quad (3.41) \\
 & - 0.013 D2 \ln RCP_t \\
 & (1.76) \\
 & - 0.019 D1 \ln RCB_t \\
 & (1.39) \\
 & - 0.015 D2 \ln RCB_t \\
 & (0.15) \\
 & + 0.832 D1 \ln(M/P)_{t-1} \\
 & (7.45) \\
 & + 0.560 D2 \ln(M/P)_{t-1} \\
 & (2.77) \\
 \bar{R}^2 = 0.969 \quad SE = 0.0044 \quad DW = 1.90
 \end{aligned}$$

Standard t-tests were used to test the hypothesis that *each* slope coefficient had remained stable *once the downward level shift in II/1974 had been taken into account*. The resulting t-statistics indicate that each coefficient had *not* changed statistically over the full-sample period. The variables and the t-statistics for their coefficients are $\ln y$ (0.43), $\ln RCP$ (0.19), $\ln RCB$ (0.03) and $\ln(M/P)_{t-1}$ (1.35). This evidence supports the view that money demand was subject to a level not a slope shift during the mid-1970s.¹⁸

CONCLUSION

The purpose of this article has been to investigate the nature of the shift in the conventional money demand specification that occurred during the mid-1970s by determining whether it was an intercept or slope shift. The empirical results presented in this article indicate that the conventional equation was subject to a level, and *not* a slope, shift in early 1974. Our analysis of the first-difference results and the

¹⁶The use of the dummy variable for the I/1960-I/1974 period and the constant term is interpreted in the following manner: The true constant term for the I/1960-I/1974 period is obtained by adding the estimated constant and the estimate on the dummy variable. The constant for the II/1974-IV/1979 period is represented by the estimate of the constant term reported in the text.

¹⁷Since the Hatanaka procedure requires estimation of the residual error in the last-stage equation, it, too, was constrained in the above manner. A test revealed that neither the error process nor ρ had changed. This procedure, in conjunction with the dummy variable test, precludes obtaining a direct estimate of ρ .

¹⁸If the preceding evidence were not sufficient to sway the skeptical reader, more support comes from the shift-adjusted, log-level equation's *ex post* forecasting record: The RMSE for the shift-adjusted equation for the period II/1974-IV/1979 is 0.67 ($\times 10^{-2}$). This value is well within two standard errors of the estimating equation's in-sample standard error, and is less than half the RMSE reported in table 2 (1.782 $\times 10^{-2}$).

properly specified log-level equation suggests that II/1974 is the most likely point of the significant downward shift in the money demand function.

An important implication of this study is that the economic relationships inherent in the conventional money demand function are more stable than previous investigations have suggested. Changes in money demand since II/1974 can be explained by changes in the exogenous variables without relying on tenuous assertions that the underlying economic relationships have degenerated. Although previous analyses have suggested that there has been a con-

tinuous, unexplained deterioration of the money demand function after 1973, our analysis suggests that the marginal relationships have remained stable over the I/1960-IV/1979 period, providing useful information in estimating the level of money demand.¹⁹ Thus, claims that the short-run money demand function is highly unstable and is responsible for the erratic behavior of money growth during this period must be reconsidered.

¹⁹For example, see Stephen H. Axilrod and David E. Lindsey, "Federal Reserve System Implementation of Monetary Policy: Analytical Foundations of the New Approach," *American Economic Review* (May 1981) pp. 246-52.